

REMARKS/ARGUMENTS

Claims 1-5 and 7-55 are pending in the application. Claims 34 and 54 have been amended. Reconsideration in view of the amendments and following remarks is respectfully requested.

The Office Action rejects claims 1, 2, 4, 5, 7-10, 13-18, 21, 22, 24-27, 29, 30, 31, 32, 34-43, 45, 46, 48-51 and 53-56 under 35 U.S.C. 103(a) as being unpatentable over Eisenhofer et al. (U.S. Patent No. 6,108,494) in view of Worthington et al. (U.S. Patent 5,881,270) and in further view of Eisenhofer et al. (U.S. Patent No. 6,339,836). The Office Action also rejects claims 3, 7, 20, 23, 28, 33, 36, 44, and 47 under 103(a) as being unpatentable over the aforementioned references and in further view of Ly et al. (U.S. Patent 6,175,946). The Office Action further rejects claims 11 and 12 under 103(a) as being unpatentable over Eisenhofer et al. ('494) in view of Worthington et al. ('270) in further view of Eisenhofer et al. ('836) and in further view of Dearth et al. (U.S. Patent 5,881,267). Claims 11 and 12 are also rejected under 103(a) as being unpatentable over Eisenhofer et al. ('494) in view of Worthington et al. ('270) in further view of Eisenhofer et al. ('836) and in further view of Dearth et al. (U.S. Patent 5,732,247). Lastly, the Office Action rejects claim 19 under 103(a) as being unpatentable over Eisenhofer et al. ('494) in view of Worthington et al. ('270) in further view of Eisenhofer et al. ('836) and in further view of Dearth et al. ('247).

The Office Action asserts that Eisenhofer ('494) teaches "data format conversions" at column 5 lines 52-67, column 6 lines 1-20, column 12 lines 34-67, and column 13 lines 1-5 and "an interface for the simulators" at column 5 lines 52-67 and column 6 lines 1-20.

Applicants respectfully assert that Eisenhofer does not disclose or suggest at least

“...operating each interface to convert the messages between a data format associated with the fixed configuration backplane and a data format associated with the simulator associated with the interface” as recited in independent claim 1.

Column 5 lines 52-67 and column 6 lines 1-20 of Eisenhofer state:

FIG. 2 conceptually illustrates the N-way co-simulation paradigm. A simulation backplane 210, such as the SimMatrix electrical simulation backplane available from Mentor Graphics Corporation, is coupled to a plurality of simulators 231-234 through their respective interfaces 241-244. The simulator interfaces 241-244 each expose a standard set of interface routines for performing functions such as initializing the simulator, performing netlist generation, e.g., writing cell descriptions, parsing netlists assigned to the simulator, registering boundary events, performing data type conversions, notifying the simulation backplane 210 when boundary events occur, and other functions to facilitate simulation. The simulation backplane 210 defines the simulation environment 200 by way of a set of procedures, protocols and functions and coordinates the interaction among the simulators 231-234. For example, the simulation backplane 210 coordinates event transaction processing, state translation, event arbitration, and manages synchronization processing among the simulators 231-234. Synchronization is the point in the simulation session at which the simulators 231-234 and the simulation backplane 210 agree on the value of time. It is only during synchronization that boundary event information, such as states, currents, or voltages, can be reliably exchanged between simulators. The frequency of synchronizations during a simulation session is directly related to accuracy and performance; the more frequent the synchronizations, the higher the resulting accuracy (to a limit) and the lower the performance (without limit). When a boundary event occurs between simulators, the simulation backplane 210 synchronizes the simulators so that they are at the same point in time and, before transferring any event information, it converts the event information to a representation usable by the target simulator. In this manner, data is reliably exchanged between simulators.

Column 12 lines 34-67 and column 13 lines 1-5 state

At step 780, the simulation backplane 210 synchronizes only those of the simulators that are associated with partitions that are dependent upon the event information. This enables data to be reliably and efficiently exchanged between simulators that require the event information. Various synchronization algorithms were described above. In addition to synchronizing the simulators, the simulation backplane 210 also performs data type conversion and transfers boundary event information, such as signal state. Signal state representation, while consistent within any one particular simulator, varies between diverse simulators. Therefore, before transferring the signal state from the source simulator to one or more target simulators, signal mapping (also referred to as data type conversion) is performed between the source and target representations in order to achieve consistent signal state representations. Exemplary conversions include the point-to-point signal mapping or mapping to intermediate simulation backplane types. Point-to-point signal mapping directly maps a data type associated with the source simulator to a data type associated with the target simulator. Mapping to intermediate simulation backplane types involves mapping from a data type associated with the source simulator to an intermediate abstract type associated with the simulation backplane 210 followed by a mapping from the intermediate abstract type to a data type associated with the target simulator. Either conversion mechanism may be implemented with a user-programmable state translation table.

After any necessary data type conversion has been performed the boundary event information may be transferred. The communication channel, the mechanism used to gather and transfer

boundary event information, varies from one simulator to another. For example, the transfer may occur through direct memory transfer (e.g., subroutine or shared memory implementation), or through inter-process communication. In any event, after the source and target simulators have been synchronized and the boundary event information has been transferred, simulation processing continues at step 740.

Therefore, specifically, column 6 line 15 of Eisenhofer discloses: “When a boundary event occurs between simulators, *the simulation backplane 210* synchronizes the simulators so that they are at the same point in time and, before transferring any event information, *it converts* the event information to a representation usable by the target simulator”.

Furthermore, column 12 line 4 states: “[i]n addition to synchronizing the simulators, *the simulation backplane 210* also performs data type conversion and transfers boundary event information, such as signal state”. Also, column 12 lines 34-61 states: “[t]herefore, before transferring the signal state from the source simulator to one or more target simulators, signal mapping (also referred to as data type conversion) is performed between the source and target representations in order to achieve consistent signal state representations. Exemplary conversions include the point-to-point signal mapping or mapping to intermediate simulation backplane types... Either conversion mechanism may be implemented with *a user-programmable state translation table*”. Therefore, the Eisenhofer reference discloses performing data type conversion with a simulation backplane possibly in conjunction with a user-programmable state translation table.

Applicants respectfully submit that none of the cited sections of Eisenhofer teach, suggest or disclose “...*operating each interface* to convert the messages between a data format associated with the fixed configuration backplane and a data format associated with the simulator associated with the interface” as specifically recited in independent claim 1. For further support, lines 15-19 of page 6 of the specification disclose “[e]ach SDI (“software based simulator-dependent interfaces”) converts the exchanged messages between the data

format supported by its corresponding simulator and the data format supported by the simulation backplane”. Applicants respectfully assert that the specific limitation of the *use of the interface* (as recited in claim 1) to convert messages between data formats is not disclosed anywhere in Eisenhofer. Instead, as discussed above, the conversion between data types is accomplished with the use of the simulation backplane or a user-programmable state translation table in Eisenhofer.

Therefore, since the specific limitations “*operating each interface to convert the messages between a data format associated with the fixed configuration backplane and a data format associated with the simulator associated with the interface*” are not taught or suggested anywhere in the Eisenhofer reference, claim 1 is in condition for allowance and the 35 U.S.C. 103(a) rejection should be withdrawn. Applicants respectfully submit that independent claims 21, 26, 29, 34, 40, 45, 51, 52, 53, 54, and 55 also contain the allowable limitations similar to the one described above, and are therefore are allowable for similar reasons. Furthermore, Applicants submit that dependent claims 2-20, 22-25, 27-28, 30-33, 35-39, 41-44, and 46-50 are allowable as depending from allowable base claims.

For at least the above reasons, the Applicants respectfully submit that this application is in condition for allowance. A Notice of Allowance is earnestly solicited.

The Examiner is invited to contact the undersigned at (408) 975-7500 to discuss any matter concerning this application.

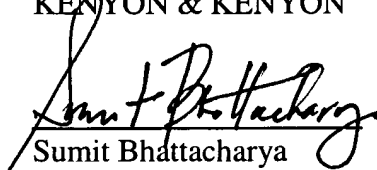
The Office is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account No. **11-0600**.

Respectfully submitted,

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